



**FEASIBILITY STUDY FOR
MARKET STREET
TRANSIT - COMMERCIAL STREET**

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Department of Parking and Traffic**

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FEASIBILITY STUDY FOR
MARKET STREET TRANSIT - COMMERCIAL STREET

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EXECUTIVE SUMMARY

Key Findings

This section summarizes the findings of the transportation analyses, observations and research conducted for the Market Street Transit-Commercial Street Study during June, July and August of 1990. Several of the traffic related findings rely on data and observations collected during a period of crosswalk reconstruction which may not represent "normal" conditions.

- Parking enforcement on Market Street is inadequate. Improved enforcement could substantially decrease the incidence of double-parking and illegal parking in the curb travel lane.
- The volume of private vehicles on Market Street is relatively light, averaging between three and six private vehicles per minute in each direction on most blocks during the midday.
- On Market Street blocks which were unobstructed by crosswalk construction during the study period, transit vehicles moved with minimal traffic-related delay. The study found little evidence to suggest that removing private vehicles from Market Street will improve Muni transit speeds, reliability or patronage.
- Market Street transit vehicles do encounter significant traffic-related delays on the First Street transit lane, Fremont Street and in turning to and from these streets from Market Street.
- Golden Gate Transit buses currently operate in an unfavorable route alignment through downtown San Francisco, decreasing the effectiveness of this regional transit service.
- Evidence from other cities indicates that removing private vehicles from transit streets does not lead to improved transit speeds or improved transit reliability unless there are significant traffic congestion problems. Studies from other cities also suggest that such projects sometimes result in an overall reduction of traffic.
- Previous experience with Market Street closures indicates that signage alone is not adequate to enforce vehicular restrictions. A substantial number of uniformed police officers would be required, at a significant cost to the city.
- The restriction would make private vehicular access to and from several downtown blocks awkward and indirect.
- Experience with previous closures of Market Street indicates that a substantial amount of Market Street traffic may be diverted to Mission Street, also an important transit street. It is difficult to estimate whether this added traffic would have a detrimental effect on Mission Street.

- It is difficult to estimate whether the introduction of Golden Gate Transit buses onto Market Street would have a detrimental effect on Muni operations. Locations where Muni operations would be most likely to encounter conflicts with Golden Gate Transit buses are on the westbound portion of Market Street between Fremont and Geary Streets and near Powell Street because of heavy bus volumes and passenger boardings.
- Other measures which could reduce the volume of private vehicles on Market Street include limiting these vehicles only during certain hours or certain days of the week, limiting them from a smaller area than the Eighth to Stueart boundaries, diverting them only at isolated locations and placing turn restrictions on additional streets which intersect Market Street.
- Other measures which could expedite transit operations on Market Street include improved parking enforcement, increased use of the rear door of buses for passenger loading at major bus stops, fixed-post traffic officers and a variety of site-specific traffic engineering improvements.

Recommendations

The following actions are recommended by the Department of Parking and Traffic to improve transit operations on Market Street and in the San Francisco Bay Region:

- Improve parking enforcement by establishing special Market Street parking control officer beats and by designating violations of Market Street truck loading bays as subject to towing. These actions can be implemented by the Department of Parking and Traffic.
- Permit Golden Gate Transit buses on Market Street west of Third Street on a trial basis. The proposed alignment is shown on Figure S-1. This action requires Board of Supervisors approval.
- Enforce the First Street transit lane between Market Street and the Transbay Terminal. This action also requires improved signage and pavement markings by the Department of Parking and Traffic and improved enforcement of moving violations by the Police Department.
- Prohibit turns onto Market Street from Fremont Street. This action will improve traffic circulation on Fremont Street and will decrease the volume of traffic on Market Street. This action requires Board of Supervisors approval.
- Install DO NOT BLOCK INTERSECTION signs at several Market Street intersections. This action can be implemented by the Department of Parking and Traffic.
- Station Fixed-Post Traffic Control Officers at the intersections of Market and First Streets and Market and Fremont Streets during peak

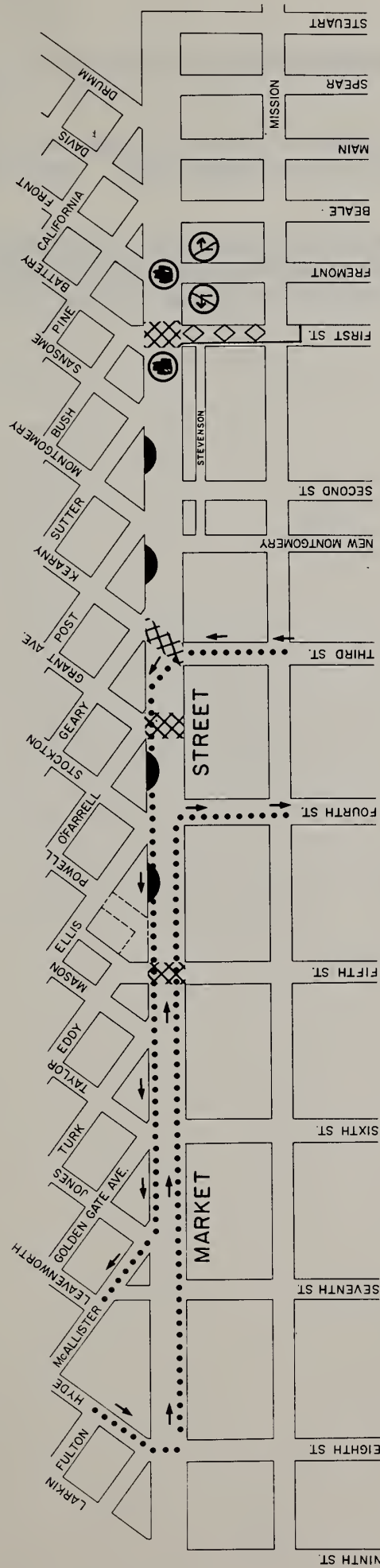


FIGURE S-1

RECOMMENDED ACTIONS

Legend

- Golden Gate Transit Test Route
- XXXXXX Install "DO NOT BLOCK INTERSECTION" Signs
- Establish Turn Prohibitions

- Assign Fixed-Post Traffic Control Officer During Peak Periods
- Improve Existing TRANSIT- ONLY Lane
- Expedite Bus Passenger Loading

periods. This action can be implemented by the Department of Parking and Traffic.

- Expedite bus passenger loading procedures at heavily used Market Street bus stops. This measure can be implemented by the Municipal Railway.

Prohibition of private vehicles from Market Street is not recommended at this time, primarily due to the difficulty of enforcing such a restriction and the limited benefit such a prohibition would provide for transit.

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Chapter 1

INTRODUCTION

This evaluation of Market Street transportation conditions responds to a resolution introduced to the Board of Supervisors for a trial restriction of private vehicles on Market Street. The proposed resolution urges that a trial restriction of the use of Market Street by private, non-commercial vehicles be tested in conjunction with the completion of the Market Street Transit Thoroughfare and the provision of Golden Gate Transit service on Market Street. The Resolution proposes that private vehicles be restricted on Market Street between Steuart and Eighth Streets. This area is considered the project study area, and is shown on Figure 1.

This report identifies the likely benefits and impacts of restricting private vehicles from Market Street, as well as the benefits and impacts of allowing Golden Gate Transit vehicles to operate on Market Street. The report is divided into four chapters: the introduction, a description of existing transportation conditions, the impacts of the proposed project and possible alternatives to the proposed project.

Project Rationale

The purpose of the proposed restrictions is to improve transit service on Market Street by reducing the number of conflicts between transit vehicles and other vehicles on Market Street. The reason for operating Golden Gate Transit

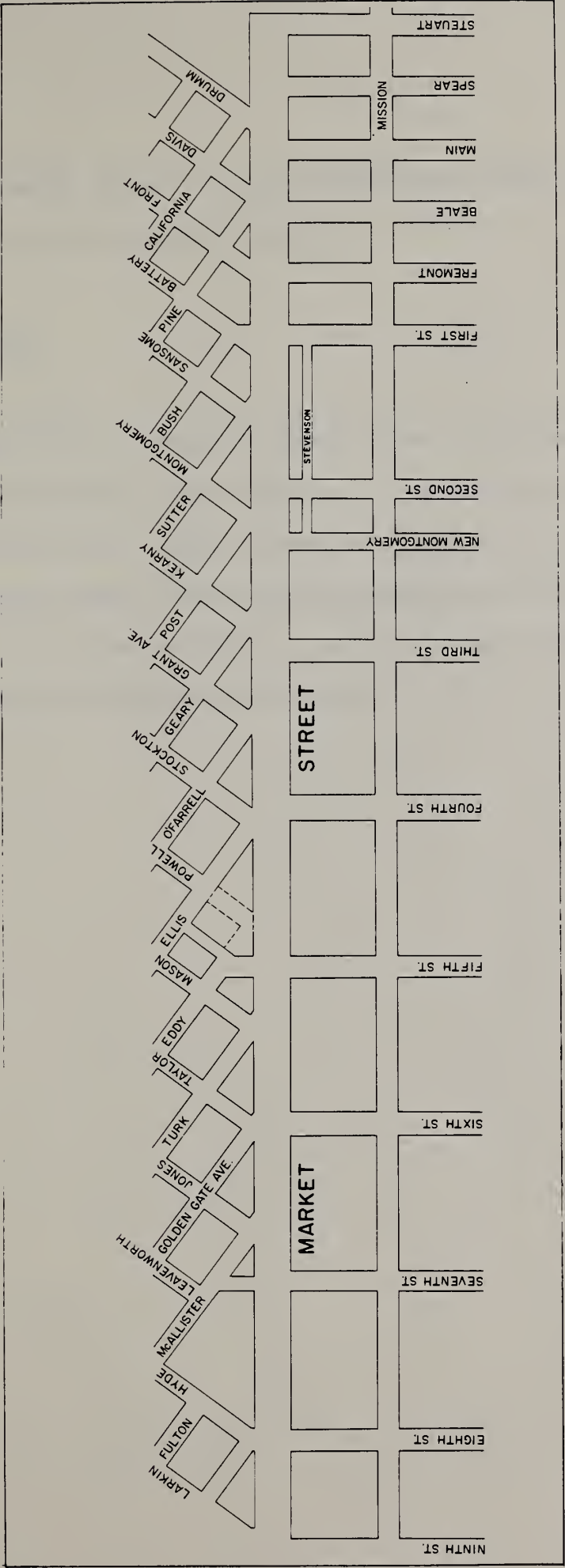


FIGURE 1
Market Street Study Area

buses on Market Street is to bring North Bay transit users closer to destinations along Market Street.

Study Staff

The study staff included Jerry Robbins and Gordon Chester of the Department of Parking and Traffic, Peter Straus of the Municipal Railway and Harvey Katz of Golden Gate Transit. Much of the field data was collected and analyzed by three summer student interns to the Department of Parking and Traffic: Lily Lim, Ed Tsui and Bruce Whitten. The report was written by Jerry Robbins of the Department of Parking and Traffic.

Chapter 2

EXISTING CONDITIONS

Market Street is San Francisco's most prominent street, dividing the downtown section of the city into two separate grid systems. This chapter describes the existing traffic, parking, transit and service vehicle conditions on the street.

Traffic Restrictions and Official Designations

Market Street has two lanes of traffic in each direction throughout the study area. Parking is prohibited throughout the study area section of Market Street, except in specially designated truck loading bays in various locations along the street. Left turns are prohibited at all times from Market Street to all streets which cross Market Street, with the exception of eastbound Market Street onto Drumm Street. There are no driveways or curb cuts along this section of Market Street; vehicular access to all buildings on Market Street is from side streets or alleys. According to the city's Master Plan, Market Street is classified as a Transit Preferential Street. Between Battery and Hayes Streets, westbound Market Street is also part of the city's 49 Mile Scenic Drive between Battery and Hayes Streets.

Traffic Volumes

The study staff conducted traffic turning movement counts at all study area intersections during the A.M. and P.M. peak periods as well as during the

midday in June of 1990. The counts divide Market Street traffic into three categories: private vehicles, transit vehicles, and commercial vehicles. Crosswalk construction, which was going on at various locations during the count period, had some impact in reducing the volume of traffic on some sections of the street.

Midday Volumes - Midday volumes are shown on Figure 2. These volumes reflect 30 minute counts performed between 10 AM and 3 PM on weekdays in June 1990. Most blocks of Market Street carried between 150 and 300 total vehicles in each direction over the 30 minute period. This volume translates to about five to ten total vehicles in each direction per minute. Approximately 60 percent of the vehicular traffic on Market Street during the midday were non-commercial or "private" vehicles. Private vehicles thus averaged about three to six vehicles in each direction per minute on most blocks of Market Street.

Peak Period Volumes - The study staff conducted 15 minute traffic turning movement counts at all study area intersections during both the morning and evening peak periods. A comparison of AM peak period, midday and PM peak period volumes indicates that AM peak period traffic volumes are lower than midday volumes on most blocks of Market Street. AM westbound volumes were highest between Drumm and Davis Streets, with about 110 vehicles within a 15 minute time period, or about seven vehicles per minute. Eastbound volumes during the AM peak were highest between Drumm and Spear Streets, with about eleven vehicles per minute.

Private Vehicles / Total Vehicles

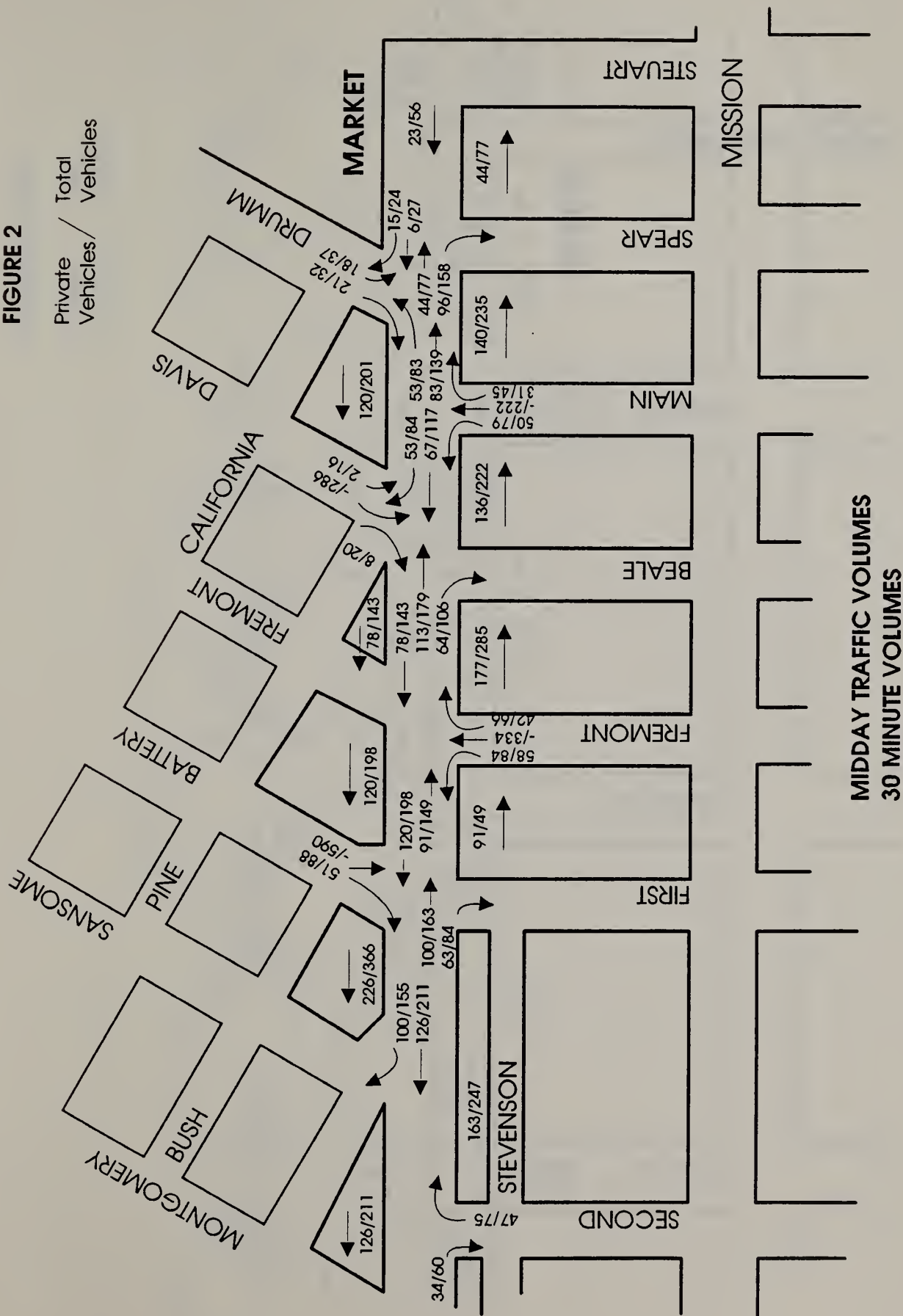


FIGURE 2 (cont.)

Private
Vehicles / Total
Vehicles

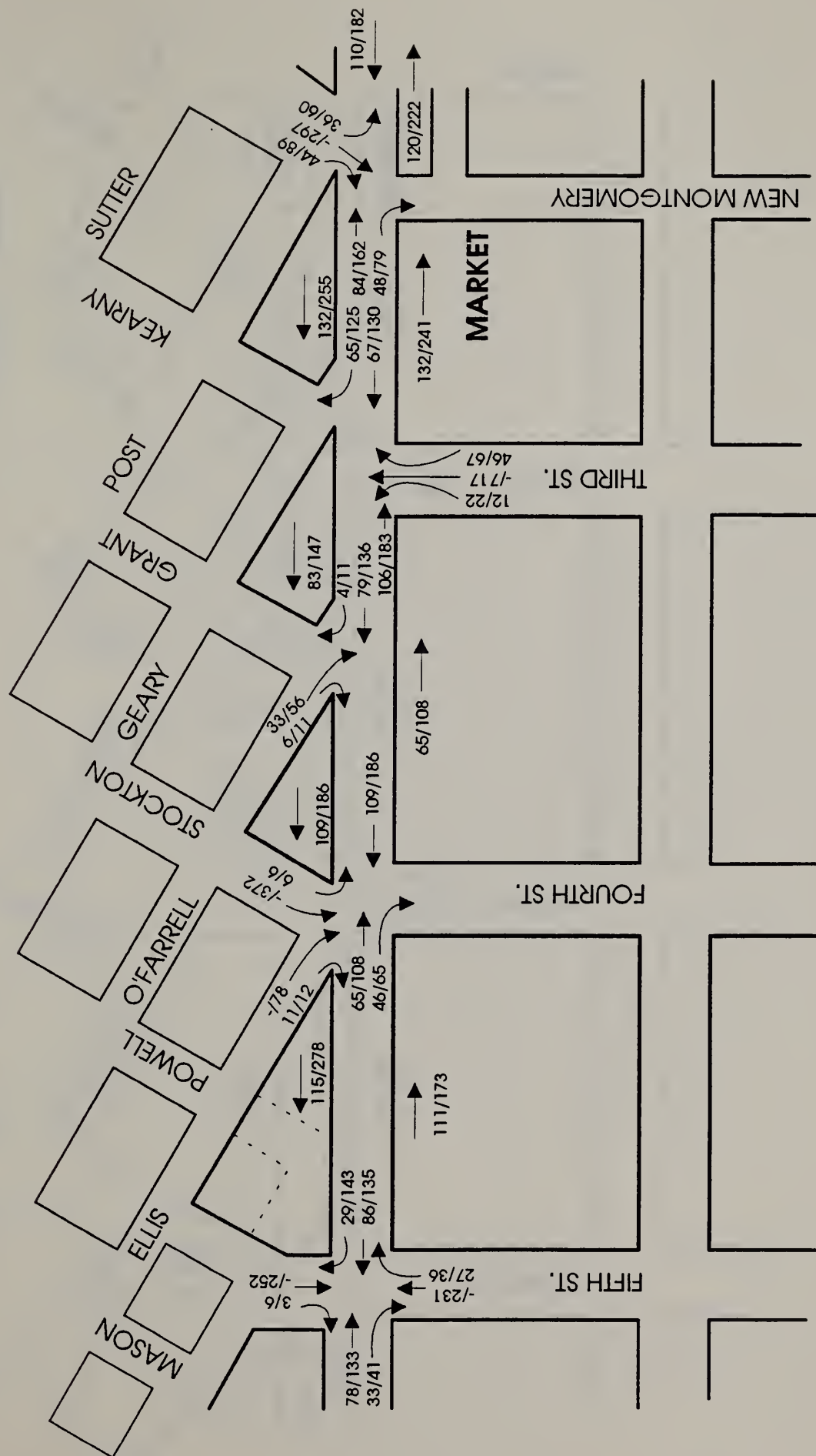
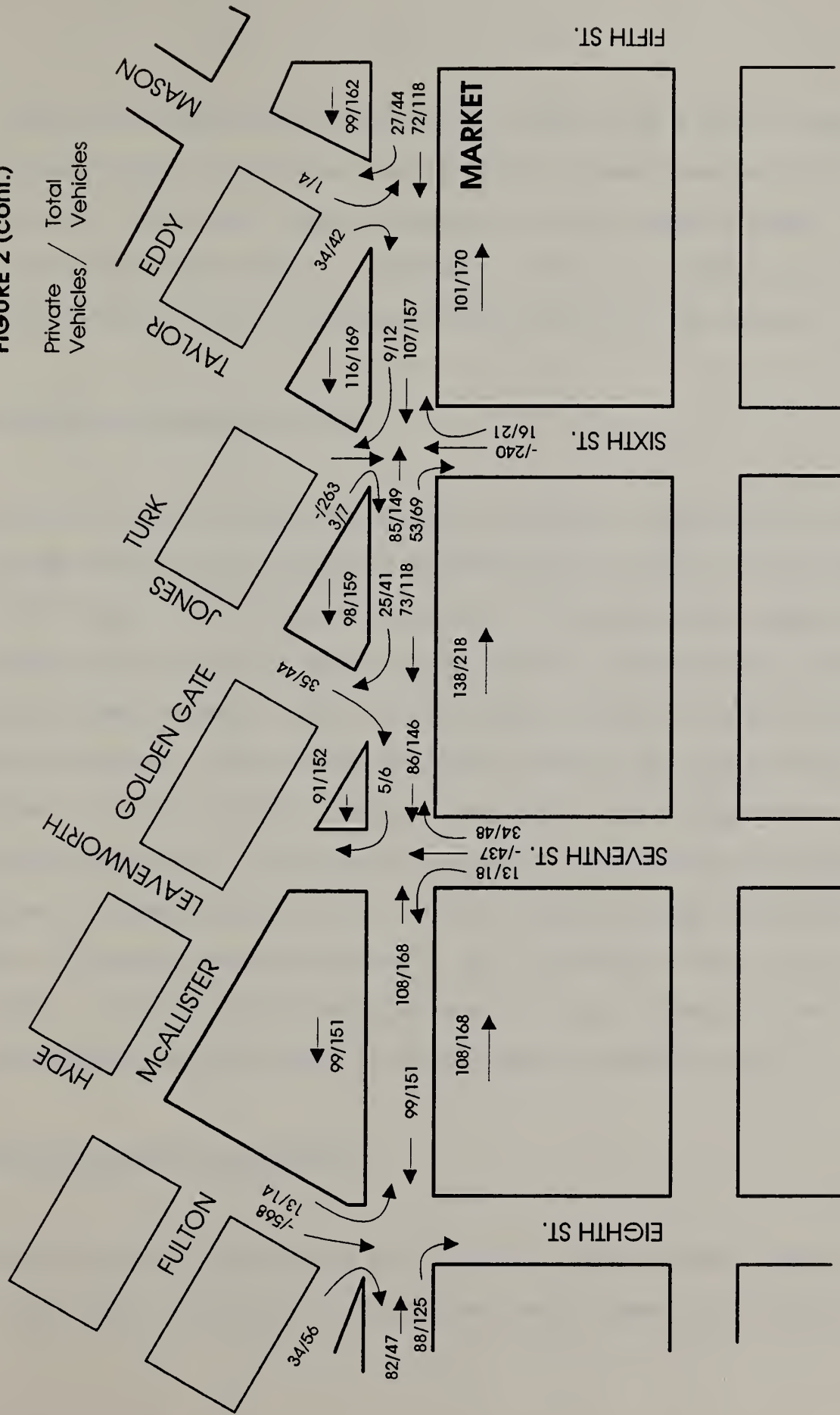


FIGURE 2 (cont.)



The PM peak period counts indicate that PM peak period traffic volumes were somewhat higher in most cases than the midday volumes shown on Figure 2. Westbound volumes were highest between Battery and Sansome Streets, with about eleven vehicles per minute. Eastbound PM volumes were highest east of Fremont Street and east of Main Street, with about ten vehicles per minute.

Through Traffic on Market Street

Study staff used a license plate matching technique to estimate the amount of through traffic on the portion of eastbound Market Street between Eighth and Sixth Streets. The findings indicate that on the study date, approximately 78 percent of the eastbound non-commercial traffic on Market Street east of Eighth Street between 8 and 9 A.M. continued eastbound on Market Street east of Sixth Street. The remaining 22 percent turned right onto southbound Sixth Street. During the midday (between 2 and 3 P.M.) the through volume declined to about 68 percent. These findings suggest that on this portion of Market Street, a sizable portion of the traffic is going "through" on Market Street for at least two blocks as opposed to only using Market Street for one or two blocks. Further data collection would be necessary to determine the percentage of through traffic on other segments of Market Street.

Parking and Loading Conditions

On-street parking and stopping is prohibited on Market Street except in truck loading bays, which have a 30 minute time limit. There are 21 such bays on

Market Street between Steuart and Eighth Streets, with space for about 100 parked vehicles.

In order to assess the effectiveness of the time limit restrictions within the truck loading bays, the study staff performed a series of parking turnover and duration studies within 12 selected truck loading bays between Sutter Street and Golden Gate Avenue. The results of this study, shown on Table 1, indicate that parking enforcement on the day of this survey was virtually non-existent. Nearly 50 percent of the vehicles parking in the truck loading bays stayed longer than the 30 minute time limit, with many vehicles occupying the same space throughout the study period. Photos 1, 2 and 3 illustrate vehicles remaining in the same truck loading space well beyond the 30 minute time limit. No parking citations were observed on any of these vehicles during the study period. At the same time, many trucks were observed parking illegally at the curb or double-parking in order to load or unload goods. It is anticipated that proper enforcement of the truck loading bays would allow many of these trucks to load from the truck loading bays as intended rather than having to park illegally.

Muni Transit Operations

The Municipal Railway operates 15 diesel bus or trolley bus routes on the portion of Market Street between Eighth and Steuart Streets. As shown on Table 2 on page 7, the number of scheduled buses travelling on various portions of Market Street is highest during the PM peak period between Fremont and Sutter Streets, where 107 westbound and 107 eastbound buses are scheduled

Table 1
PARKING TURNOVER AND DURATION STUDY
Market Street Truck Zones – Sutter to Golden Gate

Number of Spaces in Survey	48
Percentage of Spaces Occupied	77.6%
Average Parking Duration	1.3 Hours
Average Parking Turnover	3.6 Vehicles
Percentage of Overtime Parkers	48.8%
Number of Vehicles Parked 3 Hours or More	17
Number of Parking Tickets Issued	0

SOURCE: Parking Turnover Studies: Monday, June 11, 1990 10 AM-3 PM

Table 2
SCHEDULED WEEKDAY BUSES/HOUR ON WESTBOUND MARKET STREET

<u>SEGMENT</u>	<u>AM PEAK</u>	<u>MIDDAY</u>	<u>PM PEAK</u>
Steuart-Fremont	57	37	57
Fremont-Sutter	97	67	107
Sutter-Geary	92	64	102
Geary-Turk	75	50	75
Turk-McAllister	67	45	71
McAllister-Eighth	53	37	56

SOURCE: 1990 Street and Transit Map, San Francisco Municipal Railway

Includes Routes 2,5,6,7,8,9,21,31,38,38L,66,71 and 71L. Does not include route F (historic streetcar route).

Vehicles parked all day in truck-loading bays force loading trucks to double park. (Note clock in upper right.)

1. 8:45 AM



2. 12:20 PM



3. 3:00 PM





4. All Muni loading on Market Street takes place through the front door of the bus.



5. Illegal parking in the curb lane.

6. Traffic back-ups on northbound Fremont Street.



7. Pedestrians crossing Market Street delay buses turning left from northbound Fremont Street to westbound Market Street.





8. Pedestrians and right-turning traffic delay buses on eastbound Market Street at First Street.



9. Cross street traffic on Battery - First Streets blocks Market Street traffic, which has the green light.

10. Problems wltH overhead wires delay Market Street traffic.



11. A "dewired" trolley coach on Thlrđ - Kearny Streets delays Mar- ket Street traffic.





12. The back-up of traffic on Market Street prevents the second bus in the track lane from reaching the passenger loading island.



13. Golden Gate Transit's closest stop to Union Square is on Golden Gate Avenue at Jones Street.

to use Market Street per hour. AM peak period bus volumes are slightly lower than PM peak volumes, while scheduled midday volumes are about two-thirds of the AM peak frequencies. On Saturdays, Muni volumes throughout the day are about the same as the weekday midday volumes (about 60 buses per hour in each direction), while scheduled Sunday Muni service reaches a maximum of 54 buses per hour in each direction east of Geary Street.

In 1985, Muni implemented a series of measures to improve transit speeds along Market Street. These measures included the provision of two sets of overhead trolley wires in each direction along Market Street so that trolley buses would be able to use all four lanes of the street (First through Eighth Streets), the improvement of transit loading islands, the reorganization of bus stop boarding locations along Market Street to increase the distance between stops and coordinate stops with signal timings, and the retiming of traffic signals in order to minimize signal delay to transit vehicles. An analysis of the 1985 improvements indicated that these measures were effective in reducing travel times for Muni vehicles, particularly in the track lane (Source 1). That analysis also indicated that the 1985 changes had increased travel times for general traffic on Market Street. In 1988 and 1989, these improvements were complimented with widened transit loading islands, selected sidewalk narrowings in order to provide wider curb turning lanes where possible as well as a variety of other urban design improvements.

Muni Boardings and Alightings - Table 3 shows the volume of passengers who board Muni vehicles on an average weekday on various locations along westbound Market Street. This data is based on line-by-line surveys, some of which were

Table 3
WESTBOUND MUNI BOARDINGS AND ALIGHTINGS ON MARKET STREET

<u>STOP LOCATION</u>	<u>BOARDING PASSENGERS (ON)</u>			<u>ALIGHTING PASSENGERS (OFF)</u>		
	<u>Curb</u>	<u>Island</u>	<u>Total</u>	<u>Curb</u>	<u>Island</u>	<u>Total</u>
Steuart	455	-	455	0	-	0
Drumm	1,444	-	1,444	0	-	0
Front	2,079	-	2,079	73	-	73
Battery	2,167*	1,368	3,535	134*	131	265
Sansome	2,382	1,291*	3,673	231	211*	442
Montgomery	1,941	1,596	3,537	266	279	545
Kearny	1,415*	1,766*	3,181	181*	309	490
Stockton	2,129	1,712	3,841	748	897	1,645
Fifth	2,117	2,963	5,080	574	752	1,326
Mason	395	1,190*	1,585	243	423*	666
Taylor	337	904	1,241	244	403	647
Seventh	398	1,435	1,833	269	842	1,111
Hyde	316	1,129	1,445	164	565	729

SOURCE: Muni Ridecheck Data, various dates.

* Stop no longer exists

performed before the 1985 bus stop changes went into effect. Therefore, on and off volumes are shown at some locations where bus stops no longer exist. Because nearly all Muni routes on westbound Market Street originate at either Steuart Street or the Transbay Terminal, westbound buses primarily pick passengers up along the first several blocks of Market Street, and only a few passengers get off. The time needed to load the buses at these downtown stops is often quite extensive since passenger loading is done only through the front door of the bus, as shown on Photo 4. On eastbound Market Street, passengers are mainly getting off the bus, and can do so through both the front and back doors of the vehicle.

Delays and Sources of Delay - In order to assess the time savings that Muni might experience if non-commercial vehicles were prohibited from Market Street, the study staff conducted transit speed and delay studies along the portions of Market Street east of Third Street which were free of construction during June and July 1990. Observers with stop watches and clipboards rode Market Street buses and noted the duration and cause of every stop and delay experienced by the bus. The summary of the stop delay shown on Table 4 indicates that virtually all the stops experienced by Market Street buses during these observations were caused by either traffic signals or passenger loading stops. There were very few full stops caused by general traffic congestion, double-parking or other traffic-related causes. These findings may not be representative of periods when Market Street is free of construction activity, as construction activity west of Third Street might have reduced traffic volumes on the portion of Market Street east of Third Street. Additionally, some of the delay attributed to traffic signals could

Table 4
MUNI "STOP" DELAYS AND SLOWDOWNS ON MARKET STREET

"STOPS" OR MAJOR DELAYS
Market Street Between Steuart and Third Streets - June 1990

<u>CAUSE</u>	<u>AM PEAK (30 Runs)</u>	<u>MIDDAY (52 Runs)</u>	<u>PM PEAK (30 Runs)</u>
Signal Delay	55.4%	50.6%	48.6%
Loading Delay	44.6%	49.1%	49.4%
All Other Delay	<u>0.0%</u>	<u>0.3%</u>	<u>2.0%</u>
TOTAL	100.0%	100.0%	100.0%

"SLOWDOWNS" OR MINOR DELAYS
Market Street Between Steuart and Third Streets - June 1990

<u>CAUSE</u>	<u>AM PEAK (30 Runs)</u>	<u>MIDDAY (52 Runs)</u>	<u>PM PEAK (30 Runs)</u>
Traffic	41.3%	35.3%	45.9%
Parking	4.3%	6.4%	6.1%
Pedestrians	14.1%	12.8%	12.2%
Right and Left Turns	10.9%	11.5%	10.2%
Wires	21.7%	27.6%	20.4%
All Other Delay	<u>7.6%</u>	<u>6.4%</u>	<u>5.1%</u>
TOTAL	100.0%	100.0%	100.0%

SOURCE: Speed and Delay Runs, Steuart to Third Streets, June and July, 1990.

actually be due to other vehicles stopped in front of the bus at the traffic signal if the bus must wait for these vehicles to move after the signal has turned green. Some of the delay attributed to passenger loading at near side bus stops would have been experienced by the bus anyway because much of the passenger loading at these stops takes place during the red signal phase. There were no apparent differences in the percentage of delay experienced by curb lane and track lane buses.

In order to account for delays which caused the bus to slow down but not come to a full stop, observers also noted the number of times that the bus was forced to slow down and the reason for the slowdown. The results of this analysis are shown on the bottom half of Table 4. Because these "slowdown" delays do not result in the bus actually coming to a stop, their elimination would result in only a negligible improvement in travel time.

While the speed-and-delay studies indicate that most transit trips on Market Street do not experience significant traffic delays, observations indicate that there are a variety of traffic-related delays that Muni occasionally encounters along the street. For example, illegal parking in the curb lane of Market Street (shown on Photo 5) forces all traffic into the track lane, reducing the capacity of the street by one-half. As described in the parking section, vehicles which ignore the 30 minute time limit in the truck loading bays contribute to the conditions which force commercial vehicles to double-park.

Muni vehicles which travel between Market Street and the Transbay Terminal on Mission Street encounter significant traffic delays on First and Fremont Streets, particularly since the closure of the Embarcadero Freeway (see Photo 6). Delays frequently occur where the buses turn from eastbound Market Street onto southbound First Street and from northbound Fremont Street onto westbound Market Street (Photo 7) where buses must cross the path of pedestrians. At other Market Street intersections, general traffic waiting to turn right sometimes blocks the curb lane, forcing buses to move into the track lane in order to get around them. (See Photo 8).

Another occasional source of delay is cross street traffic, as shown on Photo 9. In this case, traffic on southbound Battery Street destined for southbound First Street blocks the flow of traffic on Market Street even though Market Street traffic has the green light.

Muni vehicles can sometimes delay other Muni vehicles. As shown on Photo 10, problems with overhead wiring or broken down buses can cause delays to all Market Street traffic. Trolley buses on Market Street must slow down through intersections where their power lines intersect the lines of other trolley bus routes on cross streets. If they don't slow down, the buses can "dewire," as shown on Photo 11. At the intersection of Market and Kearny Streets, Muni vehicles loading passengers on the east side of Kearny Street just north of Market Street can sometimes block traffic turning right from Market Street onto westbound Geary Street.

Finally, the queue of traffic ahead of Muni vehicles in the track lane can sometimes prevent the vehicles from moving far enough forward to reach the bus loading islands (See Photo 12). In this case, the bus must wait for the green light just to reach the loading island, and perhaps for another green signal phase before it can proceed through the intersection.

Muni Collisions - Accident statistics can be helpful in identifying locations which have a pattern of traffic conflicts. Table 5 shows the number of collisions between Muni vehicles and other vehicles at various intersections along Market Street during the last five years. The intersection of Market/Third/Kearny had the highest number of accidents, at least in part because there are heavy volumes of Muni buses on Third Street as well as on Market Street. This is also the case at the Market/Stockton/Fourth intersection, which had the second highest number of collisions. Table 6 on page 15 shows the number of Muni collisions on Market and Mission Streets each year over the last five years.

Golden Gate Transit Operations

The Golden Gate Bridge, Highway and Transportation District (GGBHTD) includes San Francisco, Marin, Sonoma, Del Norte and most of Napa and Mendocino Counties. The district has a nineteen member Board of Directors, nine of which represent the City and County of San Francisco. In 1969, the California State Legislature directed the District to develop a mass transportation system between San Francisco and the North Bay counties in order to ease traffic congestion and accommodate future traffic growth.

Table 5
MUNI COLLISIONS WITH OTHER VEHICLES
Market Street Between Steuart and Eighth Streets
1985-89

<u>INTERSECTION</u>	<u>NUMBER OF COLLISIONS</u>
Steuart	11
Spear	2
Main/Drumm	20
Beale/Davis	15
Fremont/Front	21
1st/Battery/Bush	26
Sutter/Sansome	8
2nd	14
Montgomery/New Montgomery	27
3rd/Kearny/Geary	87
Grant/O'Farrell	10
4th/Stockton/Ellis	62
Powell	4
5th	42
Mason/Turk	7
6th/Taylor/Golden Gate	24
Jones/McAllister	3
7th	14
8th/Hyde/Grove	<u>26</u>
TOTAL	423

Table 6
MUNI COLLISIONS WITH OTHER VEHICLES ON MARKET AND MISSION STREETS BY YEAR
Steuart to Eighth Streets

<u>STREET</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>TOTAL</u>
Market	123	91	66	70	73	423
Mission	<u>74</u>	<u>72</u>	<u>63</u>	<u>70</u>	<u>119</u>	<u>398</u>
TOTAL	197	163	129	140	192	821

SOURCE: Ron Hundenski, Municipal Railway

Existing bus service to and from San Francisco includes peak period "Commute Routes" oriented to the Financial District by way of Sansome and Battery Streets, and all day "Basic Routes" oriented to the Civic Center and the remainder of downtown San Francisco. Existing routes are shown on Figure 3. "Basic" service buses operate eastbound on Folsom Street and westbound on Howard Street between the Civic Center and the Transbay Terminal. Section 1183 of the San Francisco Police Code (adopted in 1953) prohibits interurban buses such as Golden Gate Transit from operating within the area generally bounded by California Street on the north, Mason Street on the west, and the southern edge of Market Street on the south and east.

Golden Gate Transit operates approximately 20 buses per hour in each direction on Howard and Folsom Streets during peak periods and 8 buses per hour in each direction during the midday period. Golden Gate Transit buses do not carry passengers whose origins and destinations are both within San Francisco, with the exception of trips to and from the Golden Gate Bridge Toll Plaza. On its trips from Marin and Sonoma Counties to San Francisco, Golden Gate Transit buses only drop off passengers in San Francisco. Similarly, Golden Gate Transit buses only pick up passengers in San Francisco on its trips from San Francisco to the North Bay. There is no transfer agreement between Muni and Golden Gate Transit buses, so passengers transferring from one system to the other must pay full fares. However, since the October 1989 earthquake, passengers on Golden Gate Transit ferries have been given free transfers to Muni buses leading both to and from the Ferry Building. Golden Gate Transit also operates peak period service from the Financial District to the North Bay using Fremont, Sansome and Battery Streets to and from its bus parking

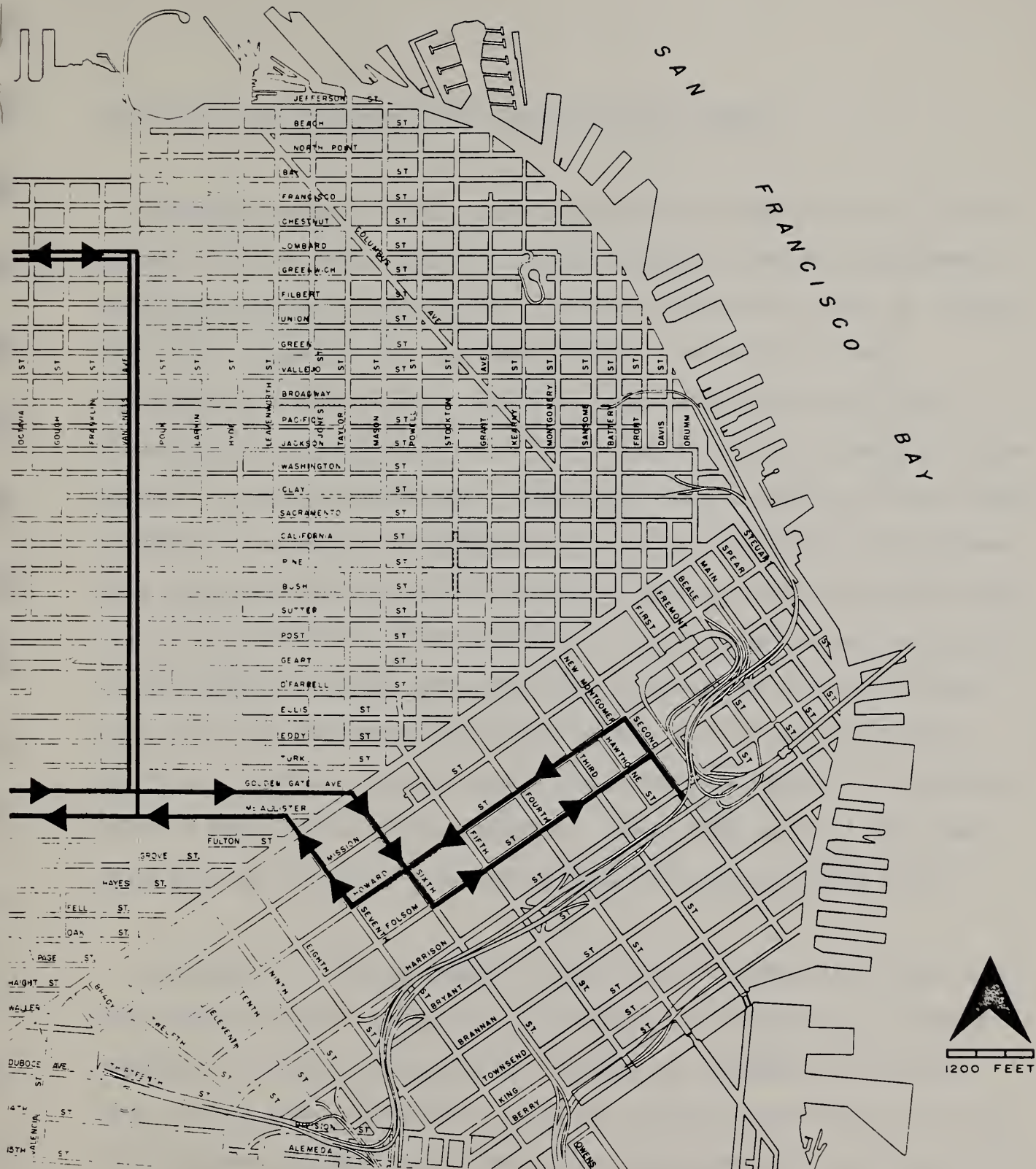


FIGURE 3

← Existing Golden Gate Transit Basic Service

facility on Folsom Street between Main and Spear Streets.

Passenger Volumes - Study staff rode Golden Gate buses on July 12, 1990 between the Civic Center and the Transbay Terminal to determine the number of passengers boarding and alighting at each bus stop and the amount of time the bus spends stopped at each stop (dwell time). The results of these observations, shown on Table 7, indicate that Golden Gate Transit buses currently pick up and drop off very few passengers on either Howard or Folsom Streets. On the 22 inbound buses ridden between Civic Center and the Transbay Terminal, 50 percent of the passengers got off the bus at the stop at Golden Gate Avenue and Jones Street (see Photo 13), while 22 percent got off at the stop on Sixth Street near Mission Street. Many of the passengers who got off at the Golden Gate Avenue and Sixth Street stops had destinations at Union Square and were advised by the bus operators to get off the bus at these Tenderloin locations. In the reverse direction, 69 percent of the boarding activity took place at the Seventh/Market Street stop, which at least some passengers had reached by transferring from Muni buses on Market Street.

Dwell Time - A limited sample of dwell times of Golden Gate Transit buses found that the buses "dwelled" for an average of 3.9 seconds per alighting passenger for drop-off stops and 12.2 seconds per passenger for boarding stops. Dwell times are generally longer at boarding stops because fares are collected when passengers board the bus and many passengers ask the bus driver questions about the service as they board. Unlike Muni buses, Golden Gate buses have no back door, requiring that all passengers getting off the bus do so through the front door.

Table 7
GOLDEN GATE TRANSIT BOARDING AND ALIGHTING ACTIVITY
22 Trips in Each Direction

BOARDINGS

<u>LOCATION</u>	<u>NUMBER OF PASSENGERS</u>	<u>PERCENTAGE</u>
2nd/Folsom	3	3
Howard/New Montgomery	13	11
Howard/3rd	3	3
Howard/4th	7	6
Howard/5th	9	8
Howard/6th	1	1
7th/Market	<u>81</u>	<u>69</u>
TOTAL	117	100

ALIGHTINGS

Golden Gate/Jones	60	50
6th/Mission	26	22
Folsom/5th	6	5
Folsom/4th	6	5
Folsom/3rd	8	7
Folsom/2nd	<u>8</u>	<u>7</u>
TOTAL	120	100

SOURCE: On-Board Ridechecks, Thursday, July 12, 1990

Conflicts With Muni Vehicles – Golden Gate Transit buses operate on the same streets as Muni buses on several San Francisco streets, including Van Ness Avenue, Sansome and Battery Streets, McAllister Street, Geary Boulevard and North Point Street. In some cases, the two transit operators share common bus stops and appear to operate without any major conflicts or delays to either operator.

Bicycle Traffic

Market Street is designated as a "preferred commuter route" for bicyclists in the Transportation Element of the City's Masters Plan, although it is not a signed bicycle route. During the summer, there are about 50 bicycles per hour in each direction on Market Street in the vicinity of Third Street.

Bicyclists generally ride in the curb lane of Market Street in order to avoid the slots beside the rails in the track lane. Some conflicts between bicycle riders and stopped buses at the curb were observed, as some cyclists try to pass the buses without entering the track lane and then dart back in front of the bus as it leaves the stop.

Pedestrian Conflicts

Market Street is one of the most active pedestrian streets in San Francisco. Pedestrians who jaywalk across Market Street sometimes delay vehicular traffic, although most jaywalkers wait for gaps in vehicular traffic before stepping into the roadway. Pedestrians walking between the sidewalk and the

transit loading islands along Market Street sometimes do so without watching for traffic in the curb lane.

Service/Access Requirements

The study staff performed a survey of the freight loading access needs of all study area buildings fronting onto Market Street. This survey involved inspections of all sides of the building to determine whether loading entrances are present on side streets or alleys on other building frontages. In cases where there was some question as to whether access was possible from streets other than Market Street, the staff observers asked merchants whether they use Market Street for their goods delivery activity.

Figure 4 shows the results of this survey. Most of buildings east of Second Street have loading access from alleys or from side streets. However, numerous smaller shops on Market Street west of Geary Street do not have rear doors and thus do all their loading from Market Street. As shown on Figure 4, truck loading bays are provided on most of these blocks, although the spaces are not always available for loading due to long-term use by other parkers.

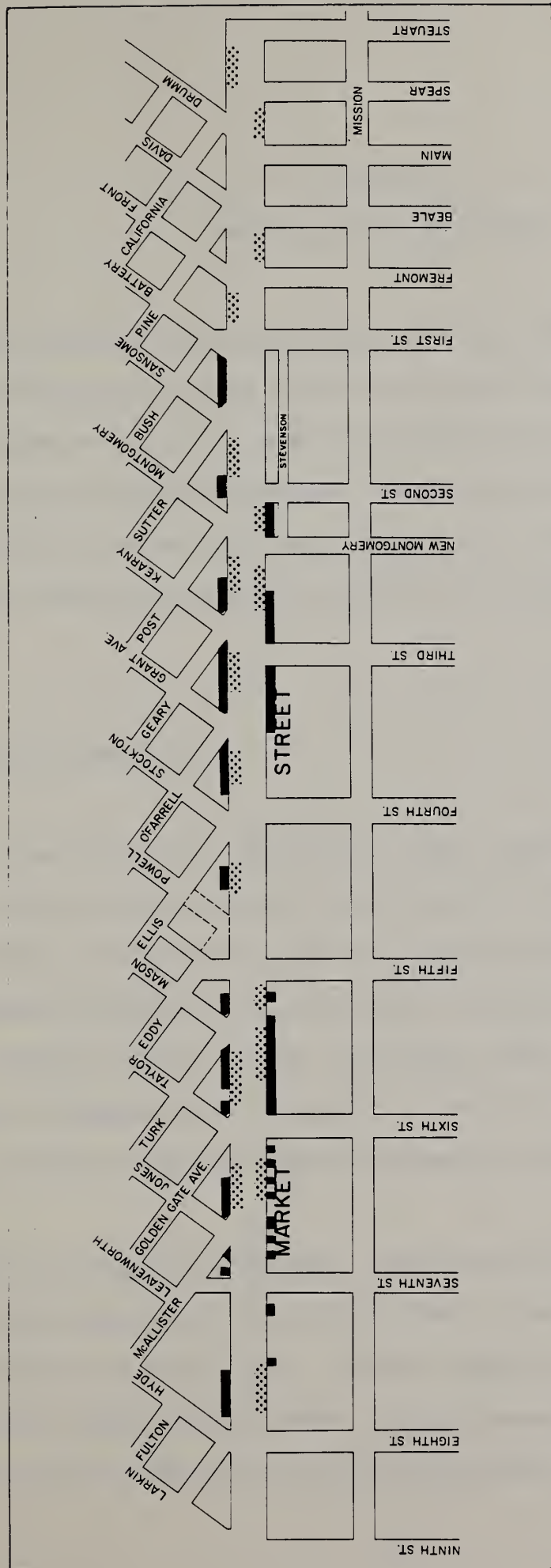


FIGURE 4
Market Street Freight Loading Access

Businesses which rely on Market Street for Freight Access
 Truck Loading Bays

Chapter 3

IMPACTS OF PROPOSED PROJECTS

This chapter assesses the likely impacts of restricting non-commercial traffic on Market Street and allowing Golden Gate Transit buses on Market Street. The chapter begins with a brief summary of findings from similar projects in other cities, and then discusses the likely impacts of the proposed projects on general traffic, and on Muni transit operations. A discussion on the level of enforcement needed to keep private vehicles off of Market Street is also provided.

Findings From Other Cities

Bus-only streets have been implemented in many cities, including Portland, Oregon (Fifth and Sixth Streets); Washington, D.C. (10th Street); Minneapolis (Nicollet Mall); Chicago (State Street); Madison, Wisconsin (State Street); Philadelphia (Chestnut Street); Vancouver, British Columbia (Granville Street); Brooklyn (Fulton Street); and Ottawa, Ontario (Bank Street) as well as several European cities. (Source 2). Available data on the effectiveness of these treatments in other cities is summarized below.

Impacts on Transit Travel Time – The literature on bus-only streets suggests that removing private vehicles from a street does not always result in improved transit travel times. A study sponsored by the Urban Mass Transportation Administration (UMTA) of the Minneapolis, Philadelphia and Portland bus malls came to the following conclusion regarding bus travel time:

"There is no evidence that overall bus trip time has decreased in Minneapolis or Philadelphia. There is evidence, however, that these transit malls would have shorter trip times than unimproved comparison streets, were it not for longer loading times and delays due to traffic signal timing. Portland reports trip time reductions of about 50 percent. Portland may have had unusually bad congestion before the mall, although new signal timing in Portland appears to allow smoother bus travel than in the other two cities. The Portland trip time reports are based on impressions rather than formal studies." (Source 3.)

Experience on Oxford Street in London, England indicates that the prohibition of all vehicles except buses, taxis and service vehicles decreased transit travel times by approximately one to two minutes over a two kilometer (1.2 mile) section. A fifty percent reduction in the variability of transit travel time was measured, indicating improved service reliability. (Source 4.)

Diverted Traffic – Experience from other cities indicates that diverted traffic is often not as big a problem as anticipated. The UMTA sponsored study had the following finding regarding diverted traffic in Minneapolis, Philadelphia and Portland:

"In general, there was a relatively small increase in traffic on streets paralleling the transit malls, either from the diversion of through-traffic from the mall streets or from the diversion of traffic with trip ends on the malls. In Portland there was actually a decline in traffic on the two parallel streets nearest to the mall, with little or no

compensating increase on parallel streets farther from the mall. In Philadelphia, increased traffic on the three major parallel streets averaged about 20 percent. However, this accounted for only about one-third of the traffic that previously used Chestnut Street. Officials in all three cities felt that the transit malls had not caused congestion on nearby streets. It appears that most mall traffic "disappears," either because motorists have found parking at more outlying locations or because some of the original circulation was unnecessary."

Experience from Oxford Street in London indicates that the traffic volume on Oxford Street was reduced by about 64 percent during the evening peak, and by about 35 percent in the morning peak, even though general traffic permitted up until 11:00 A.M. in the morning. The total traffic volume on Oxford Street along with the two parallel streets nearest Oxford Street decreased about ten percent, suggesting some increase in traffic on the other routes. The number of buses and taxis on Oxford Street increased, while the number of goods delivery vehicles decreased substantially.

Implementation Measures Required

This section evaluates the measures necessary to restrict private traffic from Market Street. The turn restrictions, signs and enforcement needed to implement the scheme are each described below.

Turn Restrictions Needed – Restricting private vehicles on Market Street between Eighth and Steuart Streets would require special turning or access

restrictions at 21 locations which currently allow access onto this section of Market Street. These locations which currently allow vehicular access to Market Street are shown on Table 8. For streets which cross Market Street, such as Third/Kearny or Stockton/Fourth, left and right turns would be prohibited for non-commercial vehicles. These vehicles would thus proceed across Market Street. For streets that end at Market Street, such as Steuart, Second, O'Farrell and Mason Streets, the diversion of traffic would be more complicated, as traffic would need to be diverted before it reached Market Street.

Signage - Any traffic restrictions along Market Street would require clear signage. Sign messages might read "NO RIGHT TURN - COMMERCIAL VEHICLES EXCEPTED" or, for eastbound traffic on Market Street approaching Eighth Street, "ALL TRAFFIC MUST TURN RIGHT - TRANSIT AND COMMERCIAL VEHICLES EXCEPTED." Permanent installation of such signs would use the existing Market Street mastarms, which also extend over the streets which cross Market Street. The project would require approximately 50 such signs, with an average cost per sign of \$1,000 for fabrication and installation.

Enforcement - Experience with previous closures of Market Street indicates that signage alone is not sufficient to discourage unauthorized vehicles from using the street. During the 1988 and 1989 construction periods, off-duty Police officers were needed as well as extensive signage in order to deter drivers from turning onto Market Street. The San Francisco Police Department estimates that up to 21 police officers would be required to prevent vehicles from accessing Market Street at the intersections shown on Table 8. The cost

Table 8
STREETS WITH EXISTING ACCESS TO MARKET STREET

South of Market Grid

<u>Street Name</u>	<u>Left Turn Onto Market</u>	<u>Right Turn Onto Market</u>
Steuart	OK	NO
Spear	-	-
Main	OK	OK
Beale	-	-
Fremont	OK	OK
First	-	-
Second	NO	OK
New Montgomery	-	-
Third	OK	OK
Fourth	-	-
Fifth	NO	OK
Sixth	NO	OK
Seventh	OK	OK
Eighth	OK	OK

North of Market Grid

<u>Street Name</u>	<u>Left Turn Onto Market</u>	<u>Right Turn Onto Market</u>
Drumm/California	OK	OK
Davis	OK	OK
Front	-	-
Battery/Bush	NO	OK
Sansome	NO	NO
Montgomery	OK	OK
Kearny/Geary	-	-
O'Farrell	OK	OK
Stockton/Ellis	OK	OK
North Fifth	NO	OK
Mason	NO (Buses Excepted)	OK
Golden Gate	NO	OK
Jones	NO	OK
North Seventh	-	-
Hyde	OK	OK

(-) Street operates one-way away from Market Street

of hiring off-duty police officers is approximately \$30 per hour. Assuming that enforcement is required 14 hours per day, seven days per week, the cost per year for traffic enforcement would exceed \$2 million.

Impacts of Market Street Restrictions on General Traffic

This section describes the traffic reroutings necessary to prohibit private vehicles from Market Street and evaluates the likely impacts of rerouted traffic on parallel streets.

Traffic Reroutings – Traffic reroutings necessitated by the proposed Market Street restrictions are shown on Figure 5. The approximate 40 private vehicles per hour which travel northbound on Steuart Street between Mission and Market Streets would either have to be prohibited from entering this block at the Steuart/Mission Street intersection or permitted to use the first block or two of Market Street.

The 100–150 private vehicles per hour on northbound Second Street at Market Street conceivably could turn either right or left onto Stevenson Street (just south of Market Street). In order to continue in an eastbound direction, these vehicles would have to go south on First Street to Folsom Street, the first opportunity to make a legal left turn from First Street. The 100–120 private vehicles per hour on eastbound O'Farrell Street approaching Market Street could turn left onto northbound Grant Avenue, then travel two blocks north to Post Street where they could turn right onto eastbound Post Street, then right again onto Montgomery Street and cross Market Street onto New

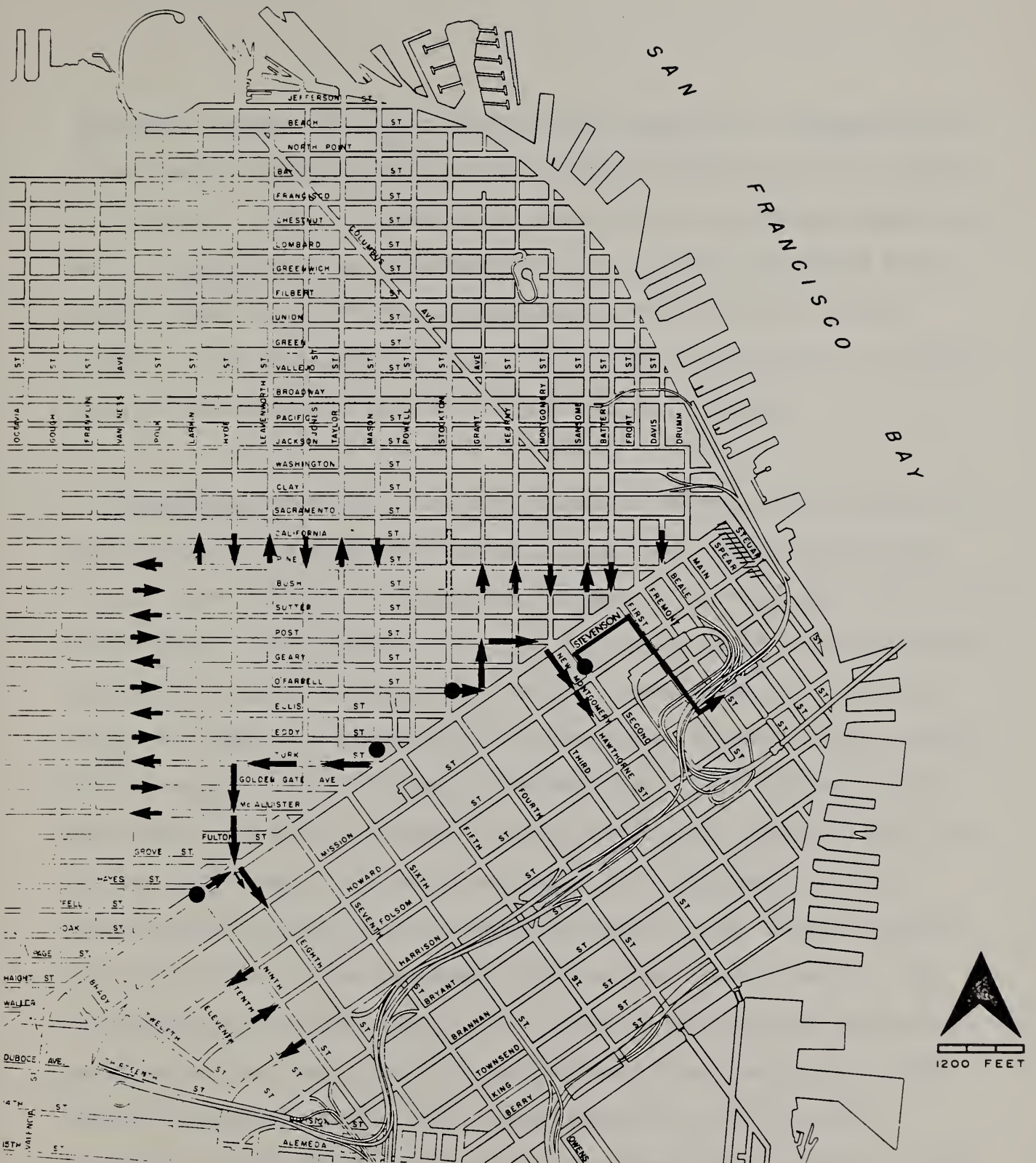


FIGURE 5
Egress Routes From Selected Blocks Without Using Market Street

● Trip Origin

▨ No Option To Market Street For Northbound Traffic

Montgomery Street. The approximate 70 private vehicles on southbound Mason Street approaching Market Street would be forced to turn right onto westbound Turk Street. Finally, the 200–250 private vehicles on eastbound Market Street east of Eighth Street would be forced to turn right onto southbound Eighth Street, where they would proceed eastward on either Mission or Folsom Streets. These diversions may prove frustrating to some drivers in trying to access or egress particular blocks adjacent to Market Street.

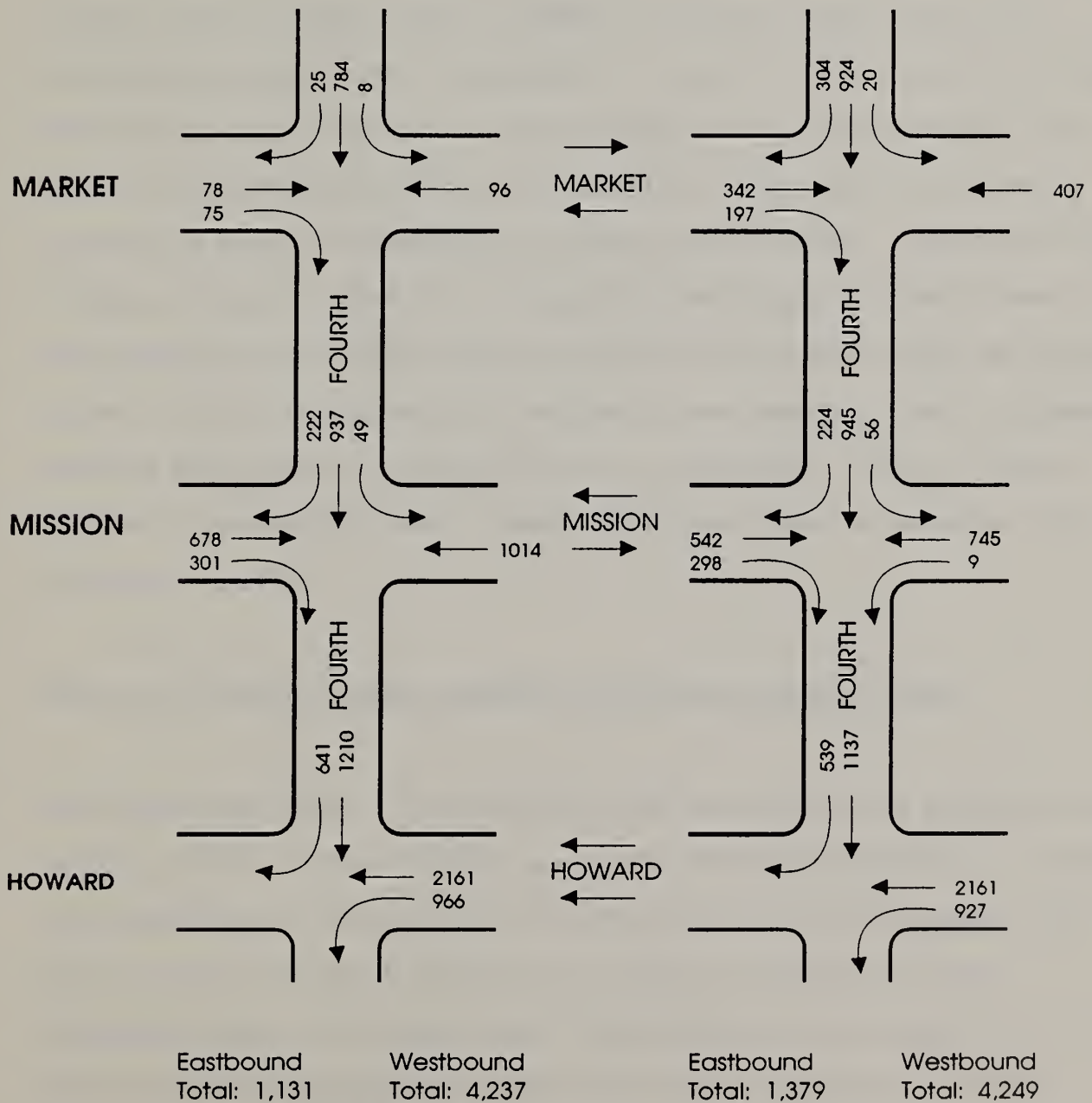
Mission Street Impacts – Previous closures of Market Street indicate that much of the traffic diverted from Market Street ends up on Mission Street. Figure 6 shows traffic turning movement volumes collected at the intersections of Market and Fourth Streets and Mission and Fourth Streets with and without the partial closure of Market Street due to roadway construction in late 1988. The comparison indicates that the reopening of Market Street resulted in a decrease in traffic volumes on Mission Street. This finding suggests that restricting traffic volumes on Market Street could increase traffic on Mission Street, which is also an important transit and traffic artery. (Mission Street carries about 27 scheduled buses per hour in each direction during the midday, including 18 Muni buses and nine SamTrans buses). The comparison also indicates that traffic volumes on Howard Street remained unchanged on these two dates, even though Howard Street was signed as the Market Street detour route. This finding appears to differ from the experience in other North American cities described at the beginning of this chapter. It is difficult to estimate whether this traffic increase would be detrimental to general traffic and transit travel on Mission Street or simply

FIGURE 6

**Traffic Volumes on Market, Mission and Howard Streets
During and After Closure of Market Street
P.M. Peak Hour**

October 20 - 26, 1988
(Market Street Partially Closed)

December 14 - 15, 1988
(Market Street Open)



Source: Wilbur Smith Associates

Source: Environmental Science Associates

absorbed into the existing flow without negative impacts on traffic. A recent photo of Mission Street is shown on Photo 13.

Impacts of Market Street Restrictions on Muni Operations

No data were collected during the summers of 1988 and 1989 which would indicate any change in Muni performance as a result of the removal of private vehicles from Market Street. Continued construction activity during the summer of 1990 makes it difficult to quantify the impacts of the proposed restriction because of construction-related traffic delays. Speed and delay studies, videotape recordings, and general observations of transit buses on the portions of the street which were free of construction delays during the summer of 1990 indicate that only very minor improvements in Muni performance could be anticipated as a result of such a restriction. There is little evidence to suggest that such a change could impact Muni's operating costs, ridership or safety.

Impacts of Allowing Golden Gate Buses to Operate on Market Street

Operation of Golden Gate Transit buses on Market Street would probably result in some increase in bus ridership due to the improved convenience of operating about one-third of a mile closer to destinations such as Union Square, the Powell Street cable car turnaround, and numerous downtown hotels and department stores. Increased transit ridership would also result in additional farebox revenue for Golden Gate Transit and could result in decreased auto travel between Sonoma, Marin and San Francisco Counties. At

the same time, the move to Market Street would probably result in slower running times for these buses, as Golden Gate Transit buses currently operate fairly quickly on Howard and Folsom Streets, unless they are delayed by special events or construction activity at the Moscone Center. Operation of Golden Gate Transit buses on Market Street is likely to enhance the visibility of these buses to the general public, simply by exposing the vehicles to more pedestrians on San Francisco streets.

Impacts of Golden Gate Buses on Market Street on Muni Operations

The impact of Golden Gate Transit buses on current Muni operations will depend primarily on the bus stop locations and on the dwell time needed for Golden Gate buses to board passengers on Market Street. Golden Gate Transit has proposed that their buses load at the curb at the following locations on Market Street between Eighth and Fremont Streets:

INBOUND (EASTBOUND) STOPS

Seventh Street (farside)
Fifth Street (farside)
Fourth-Third (midblock)
Second Street (farside)

OUTBOUND (WESTBOUND) STOPS

Battery Street (nearside)
Sansome Street (farside)
Geary Street (farside)
Powell Street (nearside)

If these changes were implemented, Golden Gate Transit would abandon existing bus stops on Golden Gate Avenue, Sixth Street, Folsom Street, Howard Street, and Seventh Street.

Golden Gate Transit buses on eastbound or "inbound" Market Street would only be dropping passengers off along Market Street, and would most likely do so without requiring more than a 20-30 second dwell time at any given Market Street stop. Westbound or "outbound" Golden Gate buses could potentially require long dwell times along Market Street while boarding passengers pay their fares, inquire about the destination of the bus, and climb the steps to get on the bus. The impacts of these dwell times on Muni operations would depend to a large extent on the volume of Muni buses operating on each particular block of Market Street.

The number of buses expected to be added to Market Street by Golden Gate Transit is shown on Table 9 below:

Table 9
BUSES PER HOUR ADDED TO MARKET STREET BY GOLDEN GATE TRANSIT

<u>TIME PERIOD</u>	<u>EASTBOUND</u>	<u>WESTBOUND</u>
AM Peak	19	10
Midday	8	8
PM Peak	10	19
Weekends	6	6

Note: See Table 2, Page 7 for existing Muni bus volumes.

The relatively low volumes of buses proposed to be added to Market Street during the midday and weekend periods (eight buses per hour) are not anticipated to have any significant impacts on existing Muni services. The greatest potential for conflicts between Golden Gate Transit and Muni buses on Market Street would take place during the P.M. peak period when Golden Gate Transit would add 19 westbound or outbound buses to the 102-107 scheduled Muni buses per hour on the section of Market Street between Fremont and Geary Streets (see Table 2, page 7). Golden Gate Transit boardings would be likely to be greatest at the proposed stops west of Fourth Street, where the number of scheduled Muni buses during the P.M. peak period is between 71 and 75 buses per hour.

The Highway Capacity Manual (Source 6) provides a method of estimating the impact of increasing the number of buses in each lane of traffic on Central Business District streets which are exclusive or near exclusive bus lanes. Adding eight additional buses to the curb lane of Market Street west of Third Street to the existing 18 scheduled Muni buses in the curb lane is estimated to increase the Level of Service from Level A (Free Flow) to Level B (Stable Flow, Unconstrained) using this method. Adding 19 buses during the P.M. peak period to the existing 37 scheduled Muni buses in the curb lane during the P.M. peak period would increase the Level of Service from Level B (Stable Flow, Unconstrained) to Level C (Stable Flow, Interference). These national standards may not be applicable to Market Street conditions. Similarly, Market Street probably does not fit the description of an exclusive or near-exclusive bus lane, to which the above designations apply.

Non-Transportation Impacts

Prohibiting private vehicles from Market Street might also effect the general "flavor" of the street in terms of noise volumes, air quality and level of activity. Reducing the volume of traffic is likely to reduce noise and air pollution somewhat, thereby improving the environment for pedestrians. On the other hand, removing all private vehicle traffic could also be viewed as having a "deadening" effect, decreasing the overall level of street activity and creating a dull environment. This issue is of particular concern in the evenings.

Chapter 4

PROJECT ALTERNATIVES

Several alternatives to the proposed projects are described in this chapter. These variations include changes to the hours of the day and the portion of Market Street on which private vehicles would be restricted, alternative measures to improve the performance of Muni buses and alternative routings for Golden Gate Transit buses.

Alternate Private Vehicle Restrictions

Alternate restrictions on private vehicle use of Market Street include variations in the days of the week and/or hours of the day in which the restrictions would be in place, changes in the boundaries of the areas in which the restrictions are in place, traffic restrictions at selected locations in order to discourage through traffic on Market Street and selected turn restrictions at Market Street intersections. The advantages and disadvantages of each of these alternatives are described below.

Alternate Days and Hours of Restrictions - The enforcement costs and level of inconvenience encountered by auto drivers may be reduced by limiting the times in which private vehicles are restricted from using Market Street. The times and days that the restrictions are in effect would be limited to those times when transit vehicles are most disrupted by private vehicle traffic. For example, transit vehicles on Market Street appear to move quite freely before 10:00 A.M. and after 7:00 P.M. on weekdays. On Saturdays and Sundays,

Market Street is quite active through the retail area, but much less active in the Financial District than on weekdays. The major advantage of this approach is decreased enforcement costs and fewer inconvenienced drivers, while the major disadvantage would be an increase in the complexity of the regulations and signage in order to specify the hours in which the restrictions are in effect.

Alternate Boundaries – The proposed boundary of Eighth Street to Steuart Street for private vehicle restrictions could be modified in several ways. Private vehicles could be prohibited only in the central portion of the study area (say Third through Fifth Streets) or at the ends of the study area (say Eighth through Seventh and Fremont to First Streets). These restrictions would de-emphasize Market Street as a through route and encourage drivers to use alternate streets. They would be less expensive to enforce and would impact fewer drivers, and may provide just as much benefit to transit as the wider restrictions. Possible disadvantages include added complexity and possible protests from businesses and merchants on the restricted blocks.

Private Vehicle Diversions – A variation of the alternate boundaries concept involves forcing all private vehicles on eastbound Market Street at Eighth Street to turn right onto southbound Eighth Street and forcing all vehicles on westbound Market Street to turn right onto McAllister Street. License plate checks performed on eastbound Market Street at Eighth Street indicate that a large percentage of this traffic currently remains on Market Street for at least two blocks. The scheme could thus reduce the number of private vehicles on the street while only requiring enforcement at a few

locations. The major disadvantage of this scheme is that it may be rather difficult to explain to the general public why private vehicles are restricted at particular isolated locations only.

Additional Turn Restrictions - As shown on Table 8, access to Market Street is currently restricted from many cross streets by NO LEFT TURN and NO RIGHT TURN signs. These prohibitions could be extended to additional cross streets such as Fremont Street, Third Street and Jones Street. The advantage of this approach is that it would decrease the number of streets that have access onto Market Street, without requiring any unusual or unique traffic restrictions. The disadvantages include less convenient circulation for general traffic which currently makes these turns, and possible difficulty in justifying the turn restrictions.

Alternate Methods to Improve Transit Performance

The Market Street analysis suggested a wide variety of measures which the city could implement to improve the flow of buses along Market Street. These measures include improved parking enforcement, rear-door boarding to speed bus loading at major transit stops, fixed-post traffic control officers and a variety of site-specific traffic engineering improvements. These measures are described below.

Improved Parking Enforcement - The need for improved parking enforcement of the truck loading bays and other portions of Market Street are documented in the existing conditions chapter of this report. Specific measures which

could be implemented include the creation of special Market Street parking control beats, designation of truck loading bays as TOW-AWAY zones, installation of meters within the truck loading bays to help identify overtime violations, and clarification of the applicability of special Contractor Parking Permits to these zones.

Increased Use of Rear Door of Muni Buses - Muni's passenger loading efficiency on Market Street is constrained by the use of only one of the bus's doors when loading passengers. At bus stops on westbound Market Street east of Fifth Street, where many passengers are boarding the buses and very few are getting off, changes in Muni's fare collection procedures which would allow rear door boarding could substantially reduce loading delays. As shown on Table 4, loading delays account for a significant part of all the delay the buses experience on Market Street, and also account for a far greater percentage of the total delay than do private vehicles.

Fixed-Post Traffic Officers - Parking and Traffic Control Officers could be assigned to direct traffic at key Market Street intersections in order to reduce traffic conflicts between buses, other vehicles and pedestrians. Candidate locations include Market and First Streets and Market and Fremont Streets, where buses cross the path of pedestrians when turning off or onto Market Street. Traffic Control Officers could whistle pedestrians back to the curb once the pedestrian indication had turned from WALK to flashing DON'T WALK, as well as cite drivers who enter the intersection without being able to exit it.

Other Traffic Engineering Improvements - Improved signage, markings and enforcement of the transit-only lane on First Street between Market Street and the Transbay Terminal could reduce traffic delays for many Market Street buses, particularly with the closure of the Embarcadero Freeway. This exclusive lane is designated by section 31.1 of the Traffic Code. A similar bus only lane on Fremont Street between the Transbay Terminal and Market Street, as well as other measures to discourage traffic leaving the Bay Bridge from using the portion of Fremont Street north of Howard Street, would also reduce post-earthquake traffic delays to transit.

Several Market Street intersections should be equipped with DO NOT BLOCK INTERSECTION signs and targeted for enforcement in order to prevent cross street traffic from blocking Market Street. Candidate intersections include Market/Drumm, Market/Battery, Market/Montgomery, Market/Third, Market/O'Farrell and Market/Fifth. The potential for Muni buses attempting to reach the bus stop on Kearny Street north of Market Street from blocking westbound traffic on Geary and Market Streets could be reduced by extending the bus stop box zone 50 or 60 feet to the north. Signal timings on Market Street could be modified at some locations to give additional green time to Market Street by taking away some green time from the cross street. Some additional commercial vehicle parking could be created on the cross streets just off of Market Street by replacing regular metered spaces with special truck loading metered spaces. Many of the specially designed overhead traffic regulatory signs on the traffic signal mast arms above Market Street are damaged and should be replaced. Finally, the 49 Mile Scenic Drive could be

re-routed in order to discourage sightseeing traffic from using westbound Market Street.

Alternate Golden Gate Transit Routings

While the current proposal calls for Golden Gate Transit buses to operate on Market Street between Fremont and Eighth Streets, an alternative would be for Golden Gate to operate no further east than Second Street or the Third and Fourth Street one-way couplet along Market Street. The advantage of these routings is that they serve the Union Square area while removing Golden Gate Transit from the part of Market Street where Muni bus volumes are heaviest (Fremont to Geary Streets). Golden Gate Transit outbound or westbound stops on Market Street could be limited to two stops: one just west of the Third/Geary intersection and one just east of Powell Street. Inbound or eastbound stops could be located just east of Seventh Street, just east of Fifth Street and midblock between Fourth and Third Streets. If the Second Street alternative is used, the existing no left turn restriction for northbound Second Street to westbound Market Street would need to be revised to NO LEFT TURN - BUSES EXCEPTED. Golden Gate Transit buses could operate on Market Street between Second and Third Streets without making any boarding stops, thus avoiding Muni's most heavily used bus stops along Market Street.

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